



# ARROYO CENTER

CHILDREN AND FAMILIES  
EDUCATION AND THE ARTS  
ENERGY AND ENVIRONMENT  
HEALTH AND HEALTH CARE  
INFRASTRUCTURE AND  
TRANSPORTATION  
INTERNATIONAL AFFAIRS  
LAW AND BUSINESS  
NATIONAL SECURITY  
POPULATION AND AGING  
PUBLIC SAFETY  
SCIENCE AND TECHNOLOGY  
TERRORISM AND  
HOMELAND SECURITY

The RAND Corporation is a nonprofit institution that helps improve policy and decisionmaking through research and analysis.

This electronic document was made available from [www.rand.org](http://www.rand.org) as a public service of the RAND Corporation.

Skip all front matter: [Jump to Page 1](#) ▼

## Support RAND

[Purchase this document](#)

[Browse Reports & Bookstore](#)

[Make a charitable contribution](#)

## For More Information

Visit RAND at [www.rand.org](http://www.rand.org)

Explore the [RAND Arroyo Center](#)

View [document details](#)

## Limited Electronic Distribution Rights

This document and trademark(s) contained herein are protected by law as indicated in a notice appearing later in this work. This electronic representation of RAND intellectual property is provided for non-commercial use only. Unauthorized posting of RAND electronic documents to a non-RAND website is prohibited. RAND electronic documents are protected under copyright law. Permission is required from RAND to reproduce, or reuse in another form, any of our research documents for commercial use. For information on reprint and linking permissions, please see [RAND Permissions](#).

Report Documentation Page				Form Approved OMB No. 0704-0188	
Public reporting burden for the collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to a penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.					
1. REPORT DATE <b>2011</b>		2. REPORT TYPE		3. DATES COVERED <b>00-00-2011 to 00-00-2011</b>	
4. TITLE AND SUBTITLE <b>Heavy Armor in the Future Security Environment</b>				5a. CONTRACT NUMBER	
				5b. GRANT NUMBER	
				5c. PROGRAM ELEMENT NUMBER	
6. AUTHOR(S)				5d. PROJECT NUMBER	
				5e. TASK NUMBER	
				5f. WORK UNIT NUMBER	
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) <b>RAND Corporation, Arroyo Center, 1776 Main Street, P.O. Box 2138, Santa Monica, CA, 90407-2138</b>				8. PERFORMING ORGANIZATION REPORT NUMBER	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)				10. SPONSOR/MONITOR'S ACRONYM(S)	
				11. SPONSOR/MONITOR'S REPORT NUMBER(S)	
12. DISTRIBUTION/AVAILABILITY STATEMENT <b>Approved for public release; distribution unlimited</b>					
13. SUPPLEMENTARY NOTES					
14. ABSTRACT					
15. SUBJECT TERMS					
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT <b>Same as Report (SAR)</b>	18. NUMBER OF PAGES <b>9</b>	19a. NAME OF RESPONSIBLE PERSON
a. REPORT <b>unclassified</b>	b. ABSTRACT <b>unclassified</b>	c. THIS PAGE <b>unclassified</b>			

This product is part of the RAND Corporation occasional paper series. RAND occasional papers may include an informed perspective on a timely policy issue, a discussion of new research methodologies, essays, a paper presented at a conference, a conference summary, or a summary of work in progress. All RAND occasional papers undergo rigorous peer review to ensure that they meet high standards for research quality and objectivity.

# Heavy Armor in the Future Security Environment

David E. Johnson

## RAND RESEARCH AREAS

CHILDREN AND FAMILIES  
EDUCATION AND THE ARTS  
ENERGY AND ENVIRONMENT  
HEALTH AND HEALTH CARE  
INFRASTRUCTURE AND TRANSPORTATION  
INTERNATIONAL AFFAIRS  
LAW AND BUSINESS  
NATIONAL SECURITY  
POPULATION AND AGING  
PUBLIC SAFETY  
SCIENCE AND TECHNOLOGY  
TERRORISM AND  
HOMELAND SECURITY

With deep budget cuts imminent, the U.S. Army has been under pressure to demonstrate a valid need for heavy brigade combat teams in the future security environment of irregular warfare and of possible air- and sea-centric conflicts with China—an environment in which many believe that such teams will be largely irrelevant. The purpose of this paper is to explain the utility of heavy armored forces (comprised of tanks and infantry fighting vehicles) against the full range of potential enemies that the United States could face in the future: nonstate irregular, state-sponsored hybrid, and state adversaries.

This paper examines the weapons, organizational skills, and command and control capabilities of these adversaries, drawing on recent experiences across the range of military operations in Iraq, Afghanistan, Gaza, and Lebanon. It identifies the contributions of heavy armored forces during these operations and describes a scalable approach to force structure that would help ensure that the United States has the capabilities needed to engage each potential adversary but without having to maintain specialized forces for every type of contingency.

## Introduction<sup>1</sup>

The U.S. Army has carried much of the load in “today’s wars” against irregular adversaries, and many in high circles believe that the Army’s future will be a continuation of the present, with any larger-scale conflicts against state adversaries falling into the realm of air and naval forces. This view was made explicit by then–Secretary of Defense Robert M. Gates in his February 25, 2011, speech at the United States Military Academy:

Looking ahead, though, in the competition for tight defense dollars within and between the ser-

vices, the Army also must confront the reality that the most plausible, high-end scenarios for the U.S. military are primarily naval and air engagements—whether in Asia, the Persian Gulf, or elsewhere. The strategic rationale for swift-moving expeditionary forces, be they Army or Marines, airborne infantry or special operations, is self-evident given the likelihood of counterterrorism, rapid reaction, disaster response, or stability or security force assistance missions.<sup>2</sup>

Secretary Gates also noted the structural and equipment-related implications of this view:

[A]s the prospects for another head-on clash of large mechanized land armies seem less likely, the Army will be increasingly challenged to justify the number, size, and cost of its heavy formations to those in the leadership of the Pentagon, and on both ends of Pennsylvania Avenue, who ultimately make policy and set budgets.<sup>3</sup>

The Army is coming under pressure to establish a valid need for heavy armored forces (equipped with tanks and infantry fighting vehicles) in the future security environment—in which many believe that such forces will be largely irrelevant. Adding to this pressure are both President Barack Obama’s goal of eliminating \$400 billion from the defense budget in the next ten years—and perhaps more—and the assumption that U.S. citizens will have no appetite for large deployments of U.S. ground forces once the conflicts in Iraq and Afghanistan end, as was apparently the case in the decades after the conflicts in Korea and Vietnam.

Together, these perceptions and pressures have made Army force structure—particularly its heavy brigade combat teams (HBCTs)—an increasingly attractive target for cost-cutters. But recent history and trends in conflict indicate that heavy forces and

This product is part of the RAND Corporation occasional paper series. RAND occasional papers may include an informed perspective on a timely policy issue, a discussion of new research methodologies, essays, a paper presented at a conference, a conference summary, or a summary of work in progress. All RAND occasional papers undergo rigorous peer review to ensure that they meet high standards for research quality and objectivity.

© RAND 2011

<sup>1</sup> I thank RAND Corporation colleagues Richard Darilek and Jeff Marquis for their thoughtful and useful reviews of the draft manuscript and Susan Woodward and Erin-Elizabeth Johnson for their editorial assistance.

<sup>2</sup> Robert M. Gates, speech, West Point, N.Y., February 25, 2011.

<sup>3</sup> Gates, 2011.

HBCTs are a crucial U.S. hedge against what is likely to be a very complex and lethal future security environment. Israel, which too believed that, in the future, ground power would largely be focused on irregular challenges and that air power would be sufficient to manage the security challenges outside its borders, was proven wrong in 2006 during the Second Lebanon War.

Lebanon illustrates some of the challenges the United States could face in the future. Other challenges could include the collapse of Pakistan and North Korea and the need to assure the security of U.S. partners in Eastern Europe and the Pacific. These potential challenges call for a broader perspective among planners and policymakers about the kind of U.S. Army that will be needed in the future to meet the four priorities stated in the February 2010 *Quadrennial Defense Review Report*: prevail in today's wars; prevent and deter conflict; prepare to defeat adversaries in a wide range of contingencies; and preserve and enhance the all-volunteer force.<sup>4</sup> To meet these priorities under these circumstances will require an Army capable of operating against not only irregular adversaries but also hybrid and state adversaries.

### **The Contributions of Heavy Forces Across the Range of Potential Adversaries**

The enemies of the United States cannot be expected to present U.S. forces with a single irregular challenge that can be easily foreseen. On the contrary, it seems far more reasonable to presume that prospective enemies will try to present challenges for which U.S. forces are not prepared. These enemies will be adaptive and will strive to present the United States with challenges that confound U.S. capabilities.

Figure 1 demonstrates the complexity and diversity of challenges that future adversaries may present. Based largely on their likely weapons, degree of organization, and command and control capabilities, it categorizes the adversaries into three groups of increasing overall capability: nonstate irregular, state-sponsored hybrid, and state. It also provides recent historical examples of each type of adversary.

Adversaries at these three levels place different demands on the military forces being designed to confront them. However, previous RAND Corporation work has shown that heavy armored forces have played important roles in conflicts involving each of

these types of adversary.<sup>5</sup> The specific contributions of heavy forces across the spectrum of conflict are described below.

### **Heavy Units Are Key Enablers for Light and Medium Forces Facing Irregular Adversaries**

In the irregular warfare environments that characterize Afghanistan and Iraq, where U.S. forces face the threat of improvised explosive devices (IEDs) and rocket-propelled grenades, heavy armor operates with much higher levels of survivability than do medium forces (such as Stryker brigade combat teams) and light forces.<sup>6</sup> Engagements against irregular adversaries generally occur at a distance of 1 kilometer (or much less) because these types of adversaries do not have standoff fire capabilities. Heavy armor enables friendly forces to survive the initial engagement and respond with precise, timely, direct fire that generally generates less collateral damage than do artillery or air strikes. The Danes, the Canadians, and the U.S. Marine Corps have integrated tanks into their ongoing operations in Afghanistan, and the United States and the United Kingdom have found tanks to be extremely useful in Iraq.

Heavy units have also proved to be the most versatile maneuver force in urban operations, such as the 2004 battle of Fallujah and the 2008 battle of Sadr City. Armored fighting vehicles, particularly tanks, have also proved invaluable as support weapons by providing mobile (including off-road) and protected precision firepower. Figure 2 shows instances of heavy armor use in urban areas.

### **Heavy Forces Are Needed When Hybrid Adversaries Have Standoff Weapons**

Hybrid adversaries use standoff weapons to expand engagement areas far beyond what irregular adversaries with lesser weapons are capable of. This makes it difficult for friendly forces to close with them. If precision guidance becomes available for indirect-fire weapons (e.g., rockets and mortars), the standoff fires challenge will only become more dire, making anti-access and area-denial operations aimed against adversaries even more challenging.

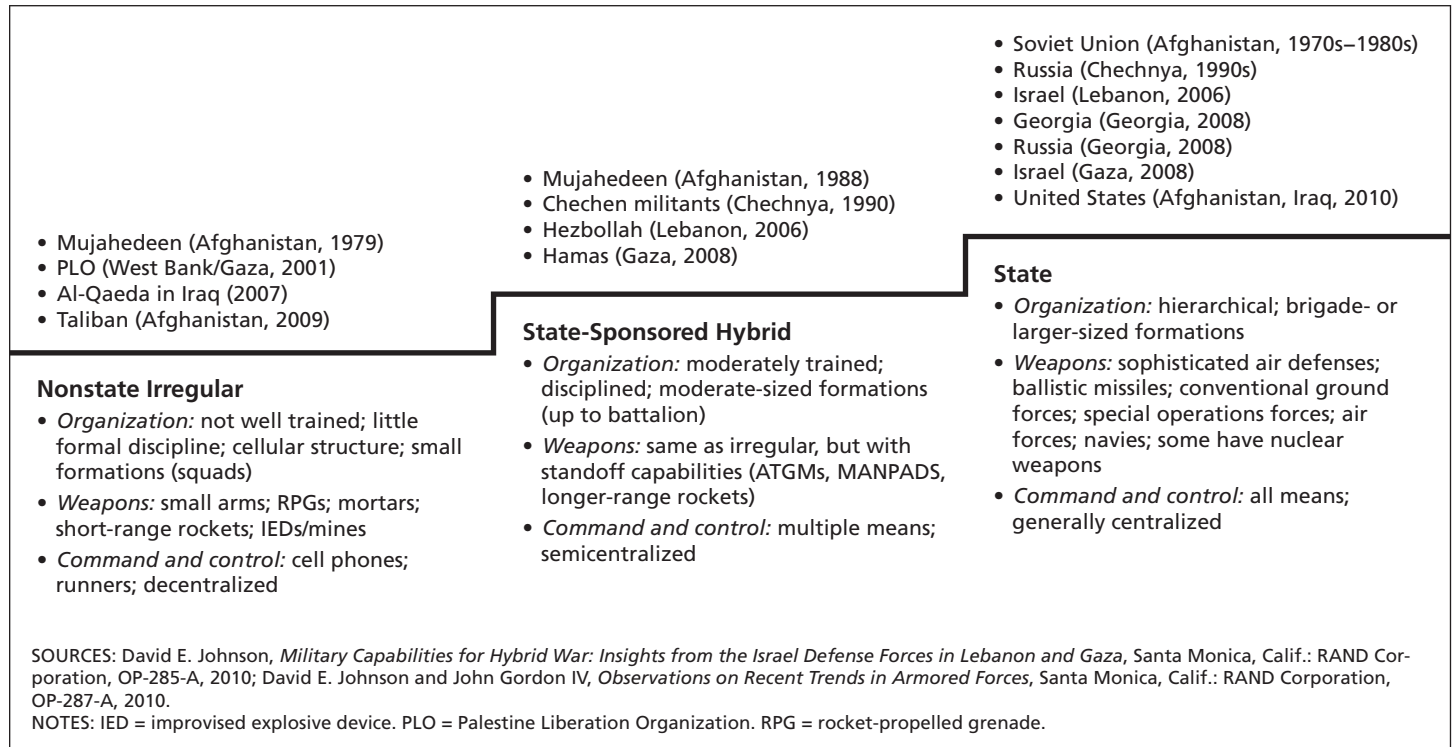
The United States has not faced a hybrid adversary since the Vietnam War. To defeat such enemies,

<sup>4</sup> U.S. Department of Defense, *Quadrennial Defense Review Report*, February 2010, p. v.

<sup>5</sup> See Johnson, 2010; Johnson and Gordon, 2010; David E. Johnson, Adam Grissom, and Olga Oliker, *In the Middle of the Fight: An Assessment of Medium-Armored Forces in Past Military Operations*, Santa Monica, Calif.: RAND Corporations, MG-709-A, 2008.

<sup>6</sup> There are few places where medium mechanized vehicles can go that tanks cannot. The sole notable exception is bridges of low to medium capacity.

**Figure 1**  
**Types of Adversary**



**Figure 2**  
**Heavy Armor in Battle of Sadr City and in Baghdad in 2008**



SOURCES: Robert Nickelsberg/Getty Images (heavy armor in the battle of Sadr City in 2008, left); 4th Infantry Division, U.S. Army (tanks in Baghdad in 2008, right).



friendly forces must use combined arms ground fire and maneuver to close with the adversaries and force them to either fight or move, thus exposing them to attack by direct and indirect fires. Heavy forces provide the protected mobility needed for this maneuver, and the joint force provides the fires needed to suppress the enemy and enable maneuver. Dismounted infantry complements heavy forces once the close fight is joined.

In the two most recent cases of hybrid warfare—the 2006 Second Lebanon War and Operation Cast Lead in Gaza—heavy armored formations were the only units able to maneuver on a battlefield where an adversary had an effective standoff weapons capability, particularly ATGMs and MANPADS. The hybrid adversaries involved in the conflicts demonstrated an understanding of advanced intelligence, surveillance, and reconnaissance and of air capabilities, and they had learned how to operate in ways that allowed them to avoid being detected and attacked by overhead sensors and aircraft. Figure 3 shows Israeli tanks operating in Gaza in 2009.

Irregular adversaries can rapidly make the leap to the hybrid level if they receive state sponsorship. If the Taliban were to attain the standoff fires capabilities that the mujahedeen eventually acquired during their war with the Soviet Union in the 1980s, the United States would find its ability to use helicopters and mine-resistant ambush-protected vehicles for air and ground mobility in Afghanistan severely curtailed, or such employment could become much more costly in terms of casualties and destroyed equipment.

### State Adversaries Only Increase the Need for Heavy Forces

The challenges posed by state actors vary greatly, ranging from the incompetent resistance offered by the forces of then-President Saddam Hussein in Iraq in 1991 and 2003 to the much more capable armed forces of China and Russia. These types of adversaries may possess sophisticated weaponry, and they present clear anti-access and area-denial challenges for the United States. Like hybrid opponents, state adversaries can create operational environments in which only heavy forces can operate with acceptable risks. The United

**Figure 3**  
**Israel Defense Forces Merkava Tanks Employed During Operation Cast Lead in Gaza in 2009**



SOURCE: Spencer Platt/Getty Images.

States has not fought a near-peer competitor—one that can contest U.S. military forces in the air, on the sea, and on land—since World War II. Figure 4 shows Russian tanks operating in South Ossetia in 2008.

### Minimizing the Risk Posed by Future Challenges

The 2011 National Military Strategy of the United States of America lays out the challenges the U.S. military will likely face in the future, and it describes the national military objectives designed to address them: counter violent extremism, deter and defeat aggression, strengthen international and regional security, and shape the future force.<sup>7</sup> However, all of these objectives are contingent on the specific environment within which they are executed.

For example, the type of future force needed to deter and defeat aggression from potential irregular adversaries is much different from that needed to counter hybrid or state adversaries. As the Israelis discovered in Lebanon in 2006, a force organized, trained, and equipped for irregular warfare can fail when it confronts an adversary with even rudimentary

standoff fire capabilities. The Israel Defense Forces (IDF) responded to the lessons from Lebanon by going “back to basics,” emphasizing combined arms competence, focusing on the ability to maneuver in the lethal hybrid environment, and equipping its forces with upgraded tanks and heavy infantry fighting vehicles. This is not to say that the IDF has turned its back on irregular warfare. Quite the contrary. The IDF has territorial units that prepare for the challenge of low-intensity conflict in the West Bank and that mostly target infiltrators bent on terrorism. These units, however, also train for high-intensity combined arms threats because the IDF understands that this competency is a necessary foundation for a military that faces challenges across the range of military operations, from irregular and hybrid conflict to state conflict. And, for the IDF and most other modern militaries, the cost of maintaining specialized forces for every type of contingency is prohibitive.

The underlying concern of this discussion is the question of how to minimize risk in shaping future U.S. Army forces. One of the principal tasks in ameliorating future risk in military operations is to

**Figure 4**  
Russian Tanks in South Ossetia During the Georgia War in 2008



SOURCE: AFP/Getty Images.

<sup>7</sup> U.S. Joint Chiefs of Staff, *The National Military Strategy of the United States of America 2011: Redefining America's Military Leadership*, February 8, 2011, p. 4.



have the right force for the operating environment within which it is deployed. Optimizing for irregular warfare would lead one to place greater value on light infantry formations that have protection against the threats such adversaries can pose, mainly short-range weapons and IEDs. Air mobility with helicopters allows these units to range widely and rapidly and to avoid in-transit threats posed by ambushes and IEDs. This is the type of force the United States has largely relied upon in Afghanistan. But what would happen to this force if it were confronted by a hybrid or state adversary with standoff weapons? Like the IDF in Lebanon, these forces would find their air mobility constrained by the MANPADS threat, and their medium and light vehicles and unprotected light infantry would be seriously at risk.

### **Recommendation**

Light forces optimized for irregular warfare cannot scale up to the high-lethality standoff threats that hybrid and state adversaries will present. As the IDF learned, a more prudent approach is to base much of

a force's structure and future capabilities on heavy forces that can scale down to confront irregular adversaries as part of a balanced force that includes light infantry. This approach is similar to that taken by the U.S. Army during much of Operation Iraqi Freedom. In that conflict, HBCTs trained for irregular warfare and employed few, if any, of their tanks, infantry fighting vehicles, and artillery during operations. Nevertheless, with only a shift in training emphasis, they could have scaled up to confront more-capable hybrid or state adversaries. Light infantry and medium armored (e.g., Stryker-equipped) forces cannot make a similar transition, even with a shift in training emphasis, because they do not have tanks and infantry fighting vehicles. This is a reality that U.S. policymakers should bear in mind as they contemplate the future structure and capabilities of the U.S. Army. America will need a force prepared to face a wide range of adversaries across the range of military operations. HBCTs should have a prominent place in that force. ■

This paper was written at the request of Lieutenant General Michael A. Vane, Deputy Commanding General, Futures/Director, Army Capabilities Integration Center, United States Army Training and Doctrine Command. The research was sponsored by the U.S. Training and Doctrine Command and conducted in RAND Arroyo Center's Strategy, Doctrine, and Resources Program. RAND Arroyo Center, part of the RAND Corporation, is a federally funded research and development center sponsored by the United States Army. Questions and comments regarding this research are welcome and should be directed to the author, David E. Johnson, at [davidj@rand.org](mailto:davidj@rand.org).

The Project Unique Identification Code (PUIC) for the project that produced this document is ASPMO09462.

For more information on RAND Arroyo Center, contact the Director of Operations (telephone 310-393-0411, extension 6419; FAX 310-451-6952; email [Marcy\\_Agmon@rand.org](mailto:Marcy_Agmon@rand.org)), or visit Arroyo's website at <http://www.rand.org/ard/>.

## **RAND**

### **HEADQUARTERS CAMPUS**

1776 MAIN STREET, P.O. BOX 2138  
SANTA MONICA, CA 90407-2138

### **OFFICES**

SANTA MONICA, CA  
WASHINGTON, DC  
PITTSBURGH, PA  
NEW ORLEANS, LA/JACKSON, MS  
BOSTON, MA

DOHA, QA  
ABU DHABI, AE

CAMBRIDGE, UK  
BRUSSELS, BE

### **REPRESENTATIVE OFFICE**

MEXICO CITY, MX

[www.rand.org](http://www.rand.org)

**RAND publications are available at  
[www.rand.org](http://www.rand.org)**

The RAND Corporation is a nonprofit institution that helps improve policy and decisionmaking through research and analysis. RAND's publications do not necessarily reflect the opinions of its research clients and sponsors. **RAND®** is a registered trademark.